Power

R_{DSON}

HS NMOS

10

Inductor 30

15

Load R & C

ESR

LS NMOS

20

R_{DSON}

FIGURE 1 (PRIOR ART)

Power

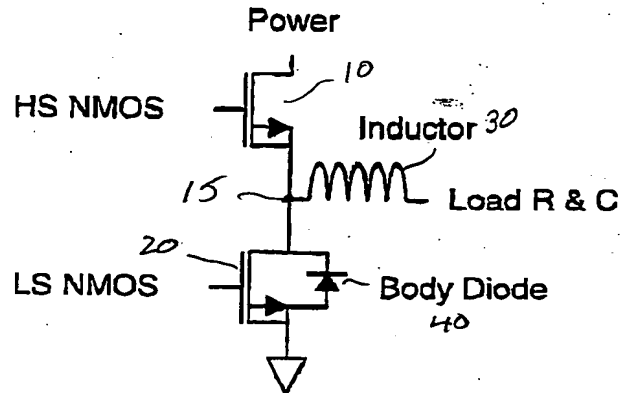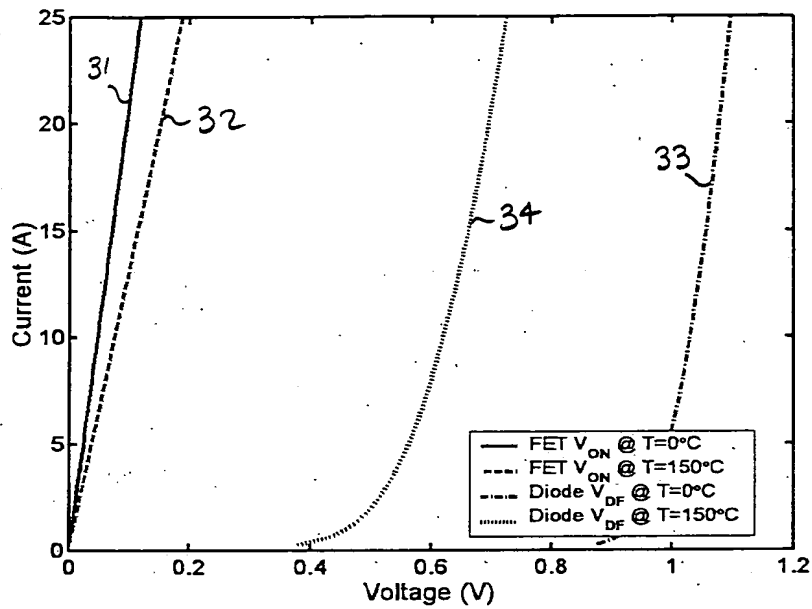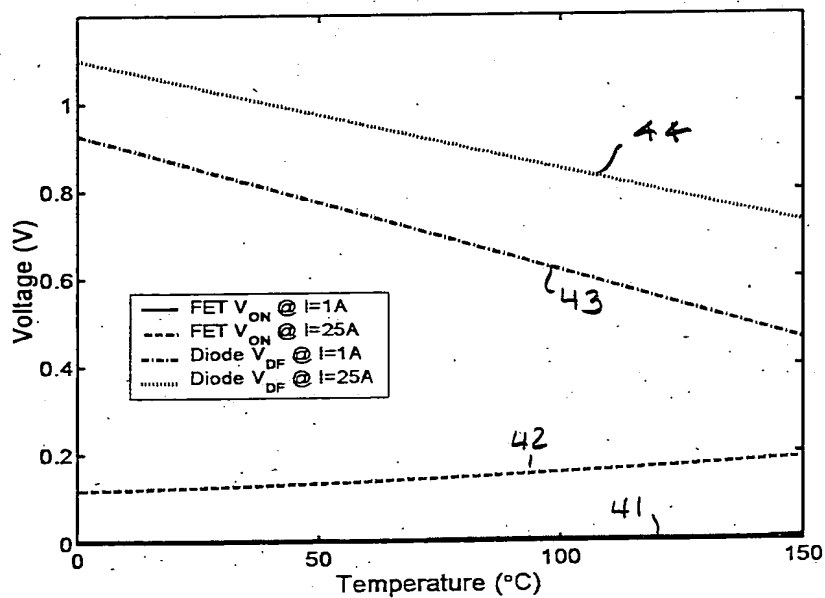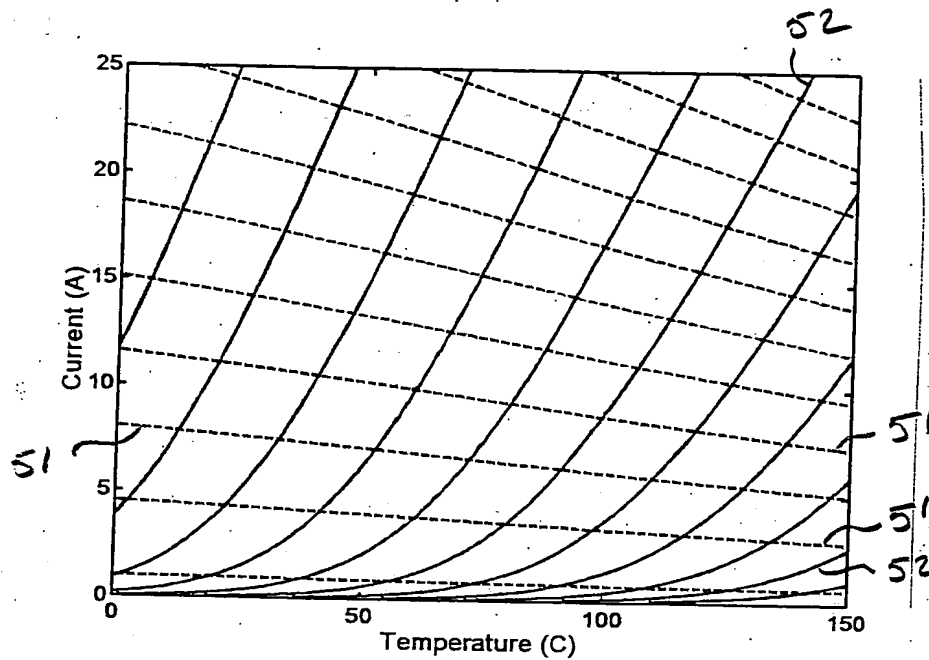HS NMOS

10

Inductor 30

15

Load R & C

20

LS NMOS

Body Diode

40

FIGURE 2 (PRIOR ART)

FIGURE 3

FIGURE 4

FIGURE 5

FIGURE 6

Power

HS NMOS ⊣ ⌐ _10_

Inductor
~30
Load R & C

20

LS NMOS ⊣ ⌐ _40_
Body Diode

72

73   74

MUX   A-D →
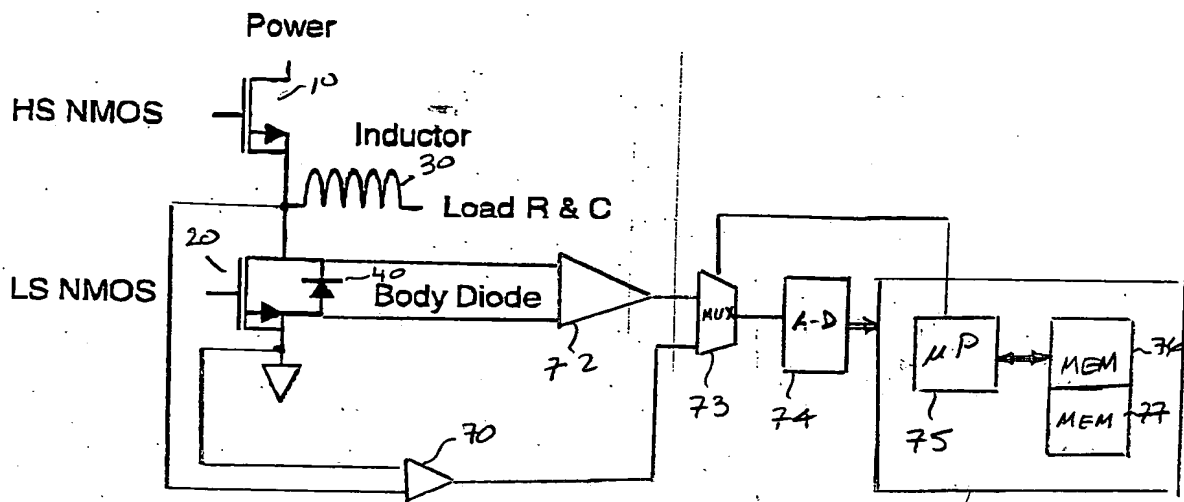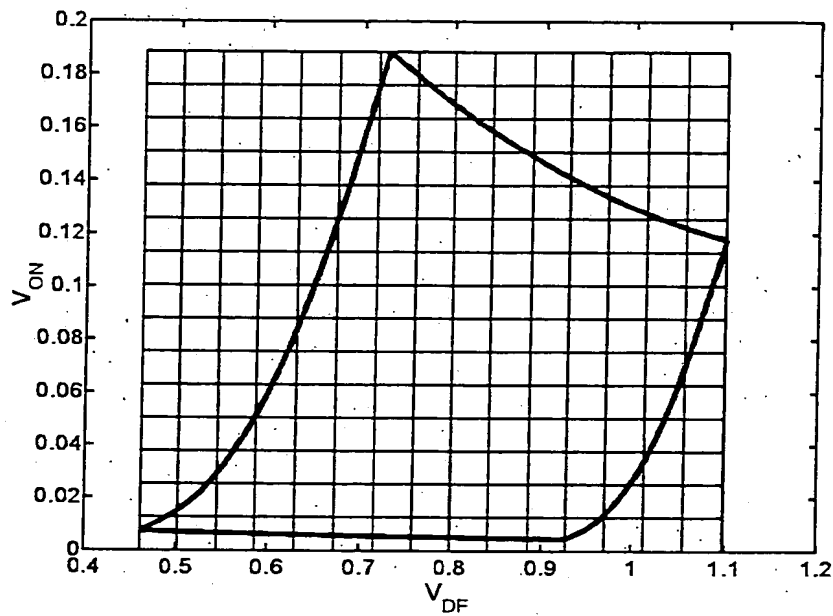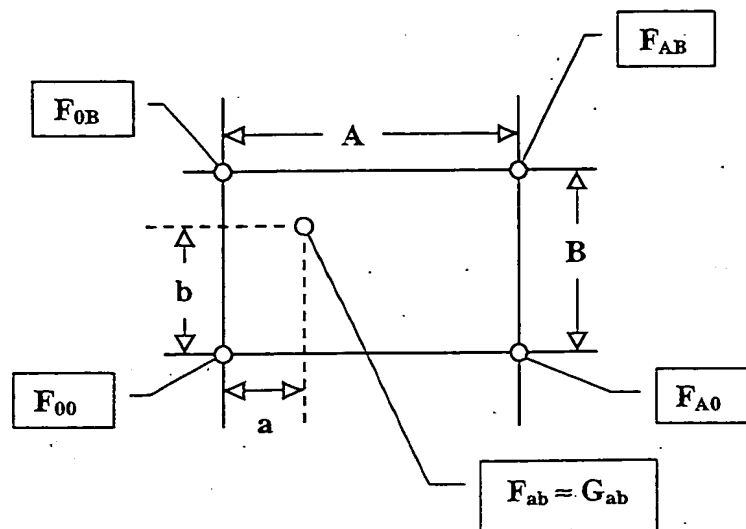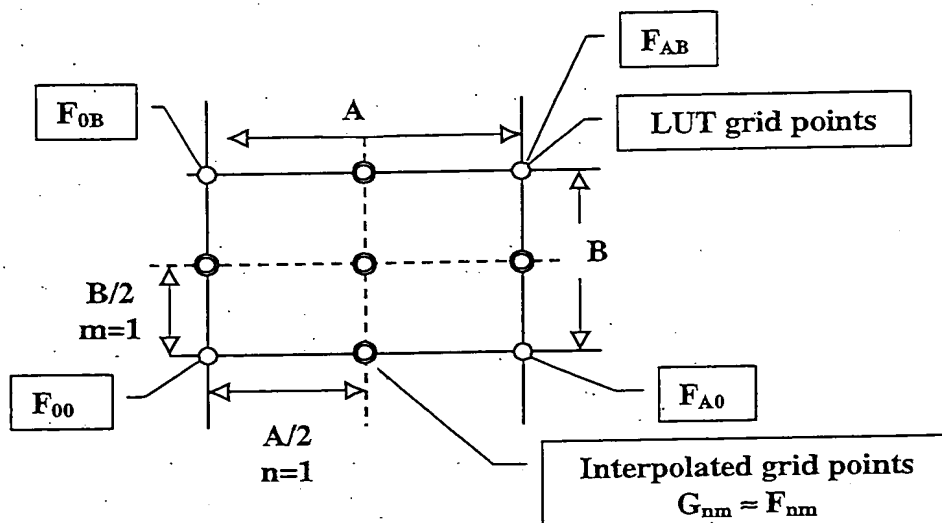
μP ⟷ MEM ~76

MEM ~77

75

70
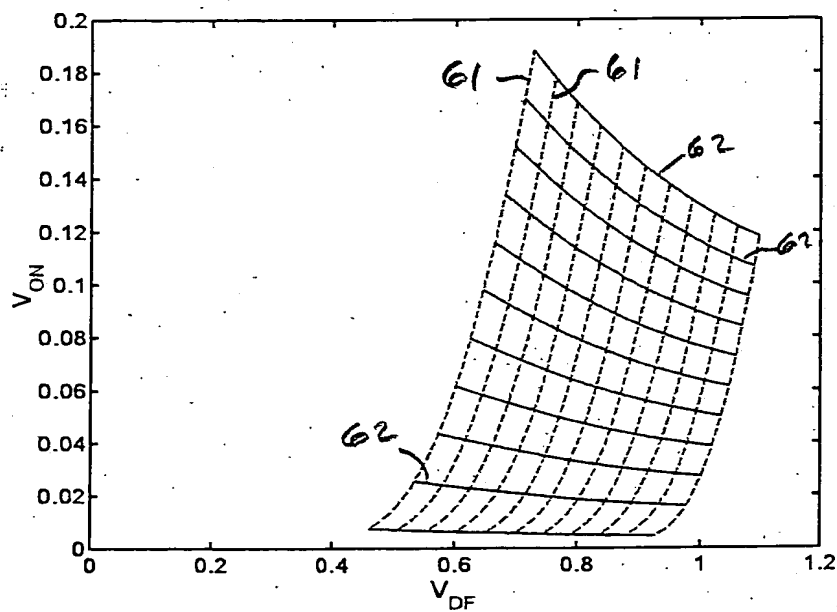
FIGURE 7

FIGURE 8

$$F_{ab} \approx G_{ab} = \{(A-a)(B-b)F_{00} + (a)(B-b)F_{A0} + (A-a)(b)F_{0B} + abF_{AB}\}(AB)^{-1}$$
$$= \{(AB - aB - Ab + ab)F_{00} + (aB - ab)F_{A0} + (Ab - ab)F_{0B} + ab\,F_{AB} + \}(AB)^{-1}$$

FIGURE 9

$$F_{nm} \approx G_{nm} = \{(2-n)(2-m)F_{00} + n(2-m)F_{A0} + m(2-n)F_{0B} + nmF_{AB}\}(4)^{-1}$$
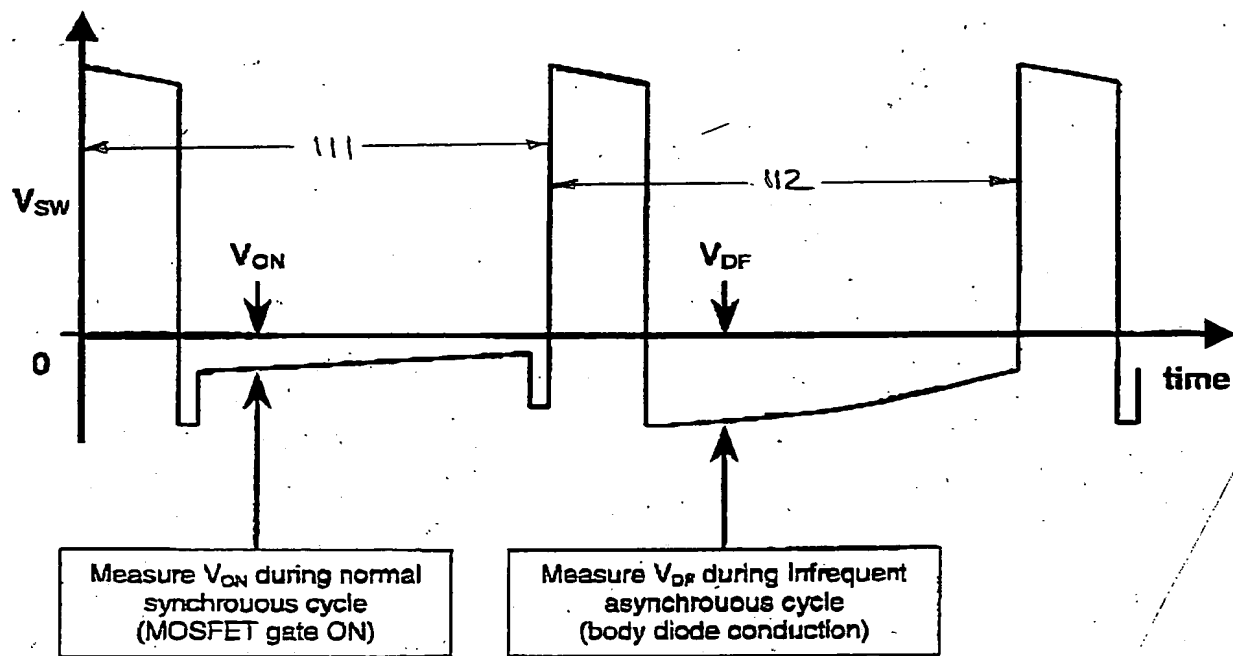$$n,m=\{0,1\}$$

FIGURE 10

V_{SW}

V_{ON}

V_{DF}

111

112

0

time

Measure V_{ON} during normal
synchrouous cycle
(MOSFET gate ON)

Measure V_{DF} during Infrequent
asynchrouous cycle
(body diode conduction)

FIGURE 11